The nature of PCT

Basic PCT offers a clear explanation for the pervasive phenomenon of simple purposeful behavior or control. Hierarchical PCT (HPCT) outlines a hierarchical arrangement as the likely organization of multiple control systems in humans.

The kind of explanation PCT offers for human behavior is the kind of explanation responsible for the successes of modern engineering.

Just hold up a finger in front of you and bend it. Notice that just before it bends, you will it to bend. The willing and the bending are facts we experience. How can you explain this phenomenon of behavior?

A "popular theory" approach has been to describe appearances in terms of themselves. Life scientists think and talk in terms of reflex, stimulus and response, affordances, conditioning, reinforcement, and cognition—terms which give phenomena new names without actually explaining them. Much research in the life sciences is focused on accumulating descriptions where weak statistical correlations suggest mysterious causal relationships.

An "engineering theory" approach is to suggest and describe the *properties* and *organization* of elements which when they *interact* with each other and their environment *produce* the kind of behavior we observe. Thus an engineering theory approach proposes a *model* or *simulation* of an underlying set of properties and causal relationships which are invisible and cannot be experienced directly, but where we gain confidence through repeated successful experimentation. Engineers learn to visualize and think in terms of models and simulations in the course of their training as they repeat the basic experiments which define the many invisible "laws of nature" or "first principles" of engineering science. In practice, engineers deduce properties of new designs from these first principles and the behavior of the designs from the properties. Engineers predict the performance of a design or model in various environments and circumstances. Thus they predict experiences they have not yet had, and with confidence. The in-depth understanding fostered by the approach of modern engineering theory is the reason for spectacular progress in the engineering sciences in the last several centuries.

Your bending of the finger (converting your thought into action) is an example of control with a changing reference signal. Behavior "emerges" from the natural properties of control systems as they interact with their environment. In engineering, control has been well explained only since the 1930s. In the life sciences of today, control is not yet part of the explanation for behavior. Thus life scientists attempting to explain "finger-bending behavior" do so without recognizing or understanding the organization and properties of the basic organizing principle of behavior.

HPCT offers a new explanation for human experience. It is technically elegant, conceptually simple, testable, and better than "common sense." The principles of HPCT are readily understood by any attentive person. In practice, a person who has learned HPCT can deduce properties of organisms and people from the principles of HPCT and see how the behavior and interactions of people "emerge" from those properties in different circumstances.

When you learn the explanations of HPCT, you can apply them to explain past experience as well as think ahead. Your own experiences suddenly make more sense to you, and you can manage and lead better in the future.

Dag Forssell, October 1994

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